



2176  
21

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Jan Andersson

Application No.: 09/381,899

Filed: December 16, 1999

For: METHOD AND APPARATUS  
FOR AUTOMATIC DATA  
ACQUISITION OF FORMS

Examiner: Bashore, William L.

Art Unit: 2176

Confirmation No.: 4564

Attorney Docket No. 911568635006

RECEIVED

APR 08 2004

Technology Center 2100

AMENDMENTS TO THE CLAIMS

Claim 1 (Cancelled)

Claim 2 (Currently Amended)

The method according to claim 41, including 1,

wherein:

generating said generated form map includes an object area list having pictorial  
content with objects contained in a presented document said unknown form.

Claim 3 (Cancelled)

Claim 4 (Currently Amended)

The method according to claim 1, including:

method for automatic data acquisition of forms whose design and informational content is not  
known in advance, said method comprising the steps of:

providing an unknown form;

generating a form map based on text, designs and colors, if present, on said  
unknown form for identifying information contained on said unknown form;

~~searching and comparing said generated form map with stored, registered maps having text designs, and color, if present, in a means for storing form maps;~~

~~storing said generated form map in said means for storing form maps when said generated form map does not co-inside with a stored map according to predetermined limits for agreement; and~~

~~indicating agreement according to the limits for agreement when agreement is found; and wherein:~~

~~said automatically generating generated form map includes a line map comprising vertical and horizontal line elements from representing text, pictorial and color content, if all are present, on objects of any shape on from said unknown presented document form.~~

Claim 5 (Currently Amended)      The method according to claim 4, including wherein:

~~horizontal line elements in said line map are used to automatically generating generate a horizontal key using horizontal line elements in said line map by dividing automatically said unknown presented document form into a predetermined number of horizontal segments along a y-axis in a cartographic system of coordinates, wherein each segment is equivalent to one horizontal key position; and~~

~~vertical line elements in said line map are used to automatically generating generate a vertical key using vertical line elements in said line map by dividing automatically said unknown presented document form into a predetermined number of vertical segments along an x-axis in said cartographic system of coordinates, wherein each segment is equivalent to one vertical key position.~~

Claim 6 (Cancelled)

Claim 7 (Cancelled)

Claim 8 (Currently Amended)      The method according to claim 5, wherein:

said horizontal key and/or said vertical key constitute a line key in the line map, and wherein during said automatic searching and comparing step, the key positions position generated are automatically is compared with key positions stored in document maps in said computer system, the means for storing said form maps for verifying agreement.

Claim 9 (Currently Amended)      The method according to claim 8, including wherein:

said key positions are automatically generating key positions sorted in the storage means according to the by a number of markings; and-

automatically sorting line keys according to the number of markings.

Claim 10 (Currently Amended)      The method according to claim 2, wherein:

an object's horizontal position in said the object area list is used to automatically generate a horizontal key by automatically dividing the unknown-presented document form into a predetermined number of horizontal segments along a y-axis in a cartographic system of coordinates, wherein each segment is equivalent to one horizontal key position; and

an object's vertical position in said the object area list is used to automatically generate a vertical key by automatically dividing the unknown-presented document form into a predetermined number of vertical segments along an x-axis in said cartographic system of coordinates, wherein each segment is equivalent to one vertical key position.

Claim 11 (Cancelled)

Claim 12 (Cancelled)

Claim 13 (Currently Amended) The method according to claim 10, wherein:

a horizontal key position and/or a vertical key position constitute an object key in ~~said the~~ object area list, wherein during said automatic searching and comparing step, ~~an the~~ object key generated is automatically compared with object keys stored in ~~said the means for storing form maps storage device for verifying agreement.~~

Claim 14 (Currently Amended) The method according to claim 13, wherein:

said object key is generated by a number of markings; and  
said the object keys are is sorted in the storage means according to said a number  
of markings.

Claim 15 (Currently Amended) The method according to claim 1, wherein:

the automatic searching and comparing step results in a pre-defined number of ~~requested probable~~ candidates for identity with the unknown presented document form; and  
manually identifying said unknown-presented document form if several identity ~~alternative~~ candidates are found as probabilities according to a factor of merit.

Claim 16 (Cancelled)

Claim 17 (Cancelled)

Claim 18 (Cancelled)

Claim 19 (Currently Amended) The apparatus according to claim ~~45~~ 18 wherein:

said automatically generated ~~form~~ map includes an object area list generated by pictorial and color content with objects contained in said ~~unknown~~ received document form.

Claim 20 (Cancelled)

Claim 21 (Currently Amended) The apparatus according to claim ~~45~~ 18, wherein:

said automatically generated form-map includes a line map automatically generated by comprising line elements on from said unknown received document form.

Claim 22 (Currently Amended)      The apparatus according to claim 21, wherein:

horizontal lines in said line map are used to automatically generate a horizontal key by automatically dividing said unknown-received document form into a predetermined number of horizontal segments along a y-axis in a cartographic system of coordinates, wherein each segment is equivalent to one horizontal key position; and

vertical lines in said line map are used to automatically generate a vertical key by automatically dividing said unknown-received document form into a predetermined number of vertical segments along an x-axis in said cartographic system of coordinates, wherein each segment is equivalent to one vertical key position.

Claim 23 (Cancelled)

Claim 24 (Cancelled)

Claim 25 (Currently Amended)      The apparatus according to claim 22, wherein:

a horizontal key and a vertical key constitute a line key in said line map, and during searching, the line key automatically generated is automatically compared with line keys stored in said computer system-storage means.

Claim 26 (Currently Amended)      The apparatus according to claim 25, wherein:

line keys are automatically sorted in the computer system storage means according to a number of markings.

Claim 27 (Currently Amended)      The apparatus according to claim ~~45-48~~, wherein:

a an object's horizontal position of a pictorial content in the unknown-received document form in an object area list is used to automatically generate a horizontal key by

automatically dividing the ~~unknown-received document form~~ into a predetermined number of horizontal segments along a y-axis in a cartographic system of coordinates, wherein each segment is equivalent to one horizontal key position; and

a an object's vertical position of a pictorial content in the received document in the object area list is used to automatically generate a vertical key by automatically dividing the received document form into a predetermined number of vertical segments along an x-axis in said cartographic system of coordinates, wherein each segment is equivalent to one vertical key position.

Claim 28 (Cancelled)

Claim 29 (Cancelled)

Claim 30 (Currently Amended)      The apparatus according to claim 27, wherein:

a horizontal key position and/or a vertical key position constitute an object key in said the-object area list, wherein during searching, the object key automatically generated is automatically compared with object keys stored in said computer system ~~the storage means~~.

Claim 31 (Currently Amended)      The apparatus according to claim 30, wherein:

said automatically generated object keys are translated to a number of markings;  
and

said object keys are automatically sorted in the computer system ~~storage means~~  
according to said number of markings.

Claim 32 (Currently Amended)      The apparatus according to claim ~~45-48~~, wherein:

~~said computer system automatically provides searching in said searching and~~  
~~comparing means results in~~ a pre-defined number of ~~requested~~ probable candidates from

automatically searching stored maps for identification automatically generated from ~~for~~ said  
unknown received documents ~~form~~; and including

a means for manual input apparatus as part of said computer system for providing  
identification content of said selected received documents ~~of the unknown form when several~~  
~~alternative candidates are found as probabilities according to a factor of merit.~~

Claim 33 (Cancelled)

Claim 34 (Cancelled)

Claim 35 (Cancelled)

Claim 36 (Cancelled)

Claim 37 (Cancelled)

Claim 38 (Cancelled)

Claim 39 (Cancelled)

Claim 40 (Cancelled)

Claim 41 (New)      A method for data acquisition comprising the steps of:

providing a computer system having document input, map generation, data  
storage, data searching, data comparing and data identification capabilities;

presenting a plurality of document to said computer system, said plurality of  
documents having a variety of formats not predefined for said computer system and containing  
data content in locations not predefined for said computer system;

automatically generating in said computer system a map of each presented  
document of said plurality of presented documents;

automatically searching in said computer system for stored document maps;

comparing in said computer system each map of each presented document of said plurality of presented documents with all document maps previously stored; and

either automatically storing in said computer system document maps of presented documents of said plurality of presented documents that do not coincide according to predetermined limits for agreement with any document map previously stored in said computer system, or automatically identifying presented documents of said plurality of presented documents where there is agreement between document maps of such presented documents according to said predetermined limits for agreement with document maps previously stored in said computer system, said automatically storing step of document maps of presented documents of said plurality of presented documents that do not coincide according to predetermined limits for agreement with any document map previously stored in said computer system occurring as each document map fails to be identified according to predetermined limits for agreement.

Claim 42 (New) The method of claim 41 wherein:

said stored document maps forms a knowledge data base.

Claim 43 (New) The method of claim 41 wherein:

each of said document maps includes document characteristics.

Claim 44 (New) The method of claim 43 wherein:

said document characteristics includes line maps, horizontal lines, vertical lines, horizontal keys, vertical keys, line keys and numbers of markings.

Claim 45 (New) An apparatus for data acquisition comprising:

~~a computer system having adaptive recognition capability and also having~~  
structure to automatically receive, generate, store, search and compare data from a plurality of



received documents having a variety of formats not predefined for said computer system and containing data content in locations not predefined for said computer system and wherein;

said computer system receives a plurality of documents having a variety of formats not predefined;

said computer system has structure to automatically generate a map of each received document of said plurality of received documents;

said computer system has structure to automatically search document maps previously stored;

said computer system has structure to automatically compare each map of a received document of said plurality of received documents with stored maps;

said computer system has structure either to indicate recognition of a map or to indicate a lack of recognition of such map; and

when there is a lack of recognition, said computer system has structure to automatically store such unrecognized maps as each of said unrecognized maps fails to be identified according to predetermined limits for agreement.

Claim 46 (New) The apparatus of claim 45 wherein:

said stored document maps form a knowledge data base.

Claim 47 (New) The apparatus of claim 45 wherein:

each of said document maps includes document characteristics.

Claim 48 (New) The apparatus of claim 47 wherein:

said document characteristics include line maps, horizontal lines, vertical lines, horizontal keys, vertical keys, line keys and numbers of markings.

Claim 49 (New) A software program for operating a computer system comprising

the steps of:

causing said computer system to receive a plurality of documents unknown to said computer system, said plurality of documents having a variety of formats including text, lines, pictorial images and color and having data content in a variety of locations, said formats and said locations not predefined for said computer system;

causing said computer system to generate a map of each received document of said plurality of received documents without manual input;

causing said computer system to search document maps previously stored, if any, in said computer system;

causing said computer system to compare each document map generated with document maps previously store, if any;

causing said computer system either to identify each of said document maps generated or to store those generated document maps not identified as each of such generated document maps fails to be identified; and

thereafter causing said computer system to continue acquisition of data content from said received documents.